

Current Status and Future Direction of *Interventional Neuroradiology*, the Official Journal of the World Federation of Interventional and Therapeutic Neuroradiology

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Summary

Interventional Neuroradiology (INR) is an international journal devoted to a highly sub-specialized field with international editorial board members and a representative journal through which the specialty of neurointervention has continuously evolved, especially through the efforts and passion of Professor Pierre Lasjaunias. Articles in INR are submitted by authors in many countries worldwide and are peer reviewed by international referees. Considering that interventional neuroradiology is the highly specialized field that INR pursues, the impact factor or the Eigenfactor score of INR is still very low partly because the LinkOut services, including PubMed, are not yet provided in a sufficiently open way. Ethical research standards should also be emphasized in INR.

Introduction

Since *Interventional Neuroradiology (INR)* began to be published quarterly in November 1995, more than 1900 copies have been made available worldwide. INR is the official journal of the World Federation of Interventional and Therapeutic Neuroradiology (WFITN), the Asian and Australasian Federation of Interventional and Therapeutic Neuroradiology

(AAFITN), the South American Working Group of Interventional and Therapeutic Neuroradiology (SAWITN), and the Japanese Society of Neuro Endovascular Therapy (JSNET). The editor-in-chief was Pierre Lasjaunias until Karel ter Brugge was appointed as the new editor at the Val D'Isere meeting in 2009. The editorial board includes Michel Mawad, Luc Picard and Karel ter Brugge, and the publisher is Nicola Leonardi of Centauro S.r.l. (Bologna, Italy)¹.

INR is a representative journal through which the specialty of neurointervention has continuously evolved, especially through the efforts and passion of professor Pierre Lasjaunias. The international composition of the editorial board and international submission of articles are both distinct advantages of INR. Although INR completely covers the activities of the WFITN, we recognize that there is room for improvement. Therefore, we wish to present and discuss the current status of INR and future directions to improve the journal.

Current status of INR

As listed by the Web of Science, 26th December 2008, there were 50 to 100 published articles annually making a total of 843, and the overall numbers of INR citations by other jour-

nals have been approximately 120 annually during the past several years (Figure 1)². The types of documents included articles (n = 688, 82%), editorial material (n = 100, 12%), letters (n = 30, 4%), reviews (n = 18, 2%), and others (n = 7, 0.8%). Authors' nationalities were broadly international and included Japan, France and the USA in order of frequency (Table 1)². Examples of the most commonly cited articles are presented in Table 2. Many major journals have cited articles published in *INR* (Table 3)².

Although *INR* has been indexed in many databases, including the Web of Science as SCIE since 1998, EMBASE/Excerpta Medica since 1997, and SCOPUS since 1996, the journal is not yet indexed in MEDLINE (PubMed) although it was once reviewed by the Literature Selection Technical Review Committee of the National Library of Medicine to be listed in PubMed in 2003³.

The impact factor (IF) was created to help evaluate a journal's relative importance, especially when compared to others in the same field. IF is calculated by dividing the number of current citations of articles published in the previous two years by the total number of articles published in the two previous years. The IF trends of *INR*, as shown in Figure 2, reveals that the IF of *INR* is still below 0.5.

There is a significant linear correlation between the number of journals in any particular field and the top IF within that field, thereby suggesting that the size of the field also greatly affects the scale of IF⁴. This explains why *INR*

has a low IF as neurointervention is a highly specific field with only a small number of journals. Unlike other related journals, as *INR* is a sub-specialized journal dedicated only to neurointervention, this factor decreases the citation pool. It is widely acknowledged that the IF calculation favors journals which primarily publish review articles⁵ as these tend to be cited more often than original research papers⁶. *INR* has only 18 review articles among the total of 843 articles published to date.

The median IF in the Subject Category in which *INR* is categorized as CLINICAL NEUROLOGY is 1.946; Lancet Neurol (10.169) is the first ranked and *INR* (0.169) is 143rd among 146 journals. *INR* is also listed in the category of RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING which has a median IF of 1.625; Hum Brain Mapp (6.151) is the first ranked and *INR* is 87th (0.169) among 87 journals⁷. Citation counts alone cannot be used to compare the quality of scholarly journals, and the IF calculation was created to provide a standardized grading scale among journals⁸. Although there continues to be considerable debate regarding the IF in terms of a quality indicator, most studies have shown it to be a reasonable measure of comparative journal quality within a given scientific field.

The Journal Immediacy Index is an average measure of how quickly an article in a scientific journal is cited and is calculated by dividing the number of citations to articles published in a given year by the number of articles published in that year. The Journal Immediacy Index of *INR*, which is calculated by dividing the number of citations to current articles in 2007 (n = 0) by the number of articles published in 2007 (n = 36), was unfortunately 0 in 2007⁷. Journals that are published weekly or monthly have an advantage over journals with fewer annual issues, such as *INR*. It is important to remember that as the citation figures used in the JCR include self-citations, journals that regularly publish editorials containing references to articles in the same issue will have a higher Immediacy Index than other journals⁸. The percentage not cited (percentage of articles published in any particular year that have not been cited to date) of *INR* is very high compared to other journals such as the *Neurosurgery*, the *American Journal of Neuroradiology*, and *Neuroradiology* (Figure 3)⁹.

INR had 6.7 years of cited half-life in 2007

Table 1 Regional distribution of authors.

Field: Country/Territory	Record Count	% of 843	Bar Chart
Japan	285	33.8	
France	127	15.0	
USA	83	9.8	
Canada	55	6.5	
Italy	49	5.8	
Germany	38	4.5	
South Korea	32	3.7	
Peoples China	29	3.4	
England	22	2.6	
Switzerland	15	1.7	

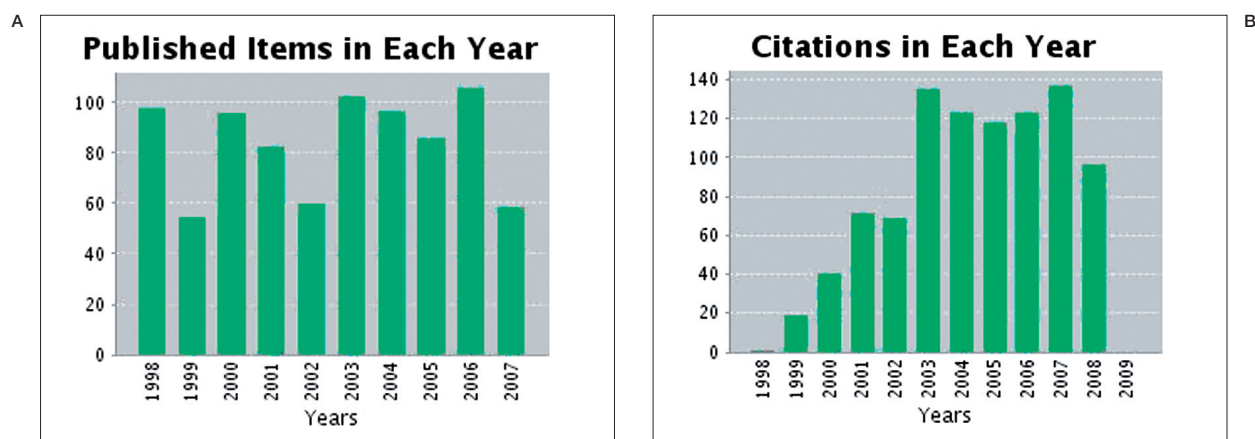


Figure 1 Number of Published Articles A) and Citations B) of *Interventional Neuroradiology* in each year (provided by the ISI Web of Knowledge).

indicating that articles published in *INR* between the last quarter of 2001 and 2007 account for 50% of all citations to *INR* articles in 2007. The citing half-life of *INR* was 7.9 years in 2007 indicating that 50% of all cited articles from the *INR* in 2007 were published between 2000

and 2007. These two calculations simply show the age range of 50% of *INR*'s cited and citing articles in a given year and do not directly reflect journal quality.

Low-cited and citing half-life figures can indicate that a journal publishes in a rapidly

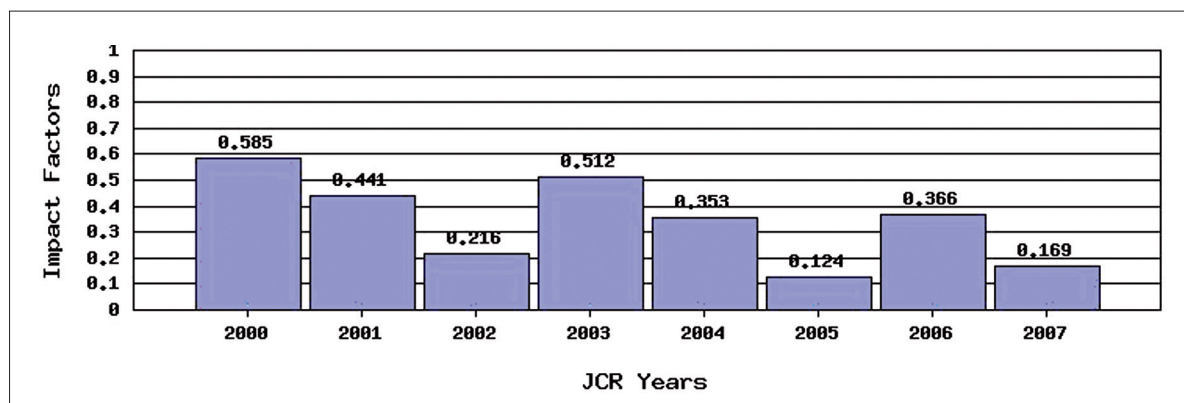


Figure 2 Impact Factor Trends of *Interventional Neuroradiology*.

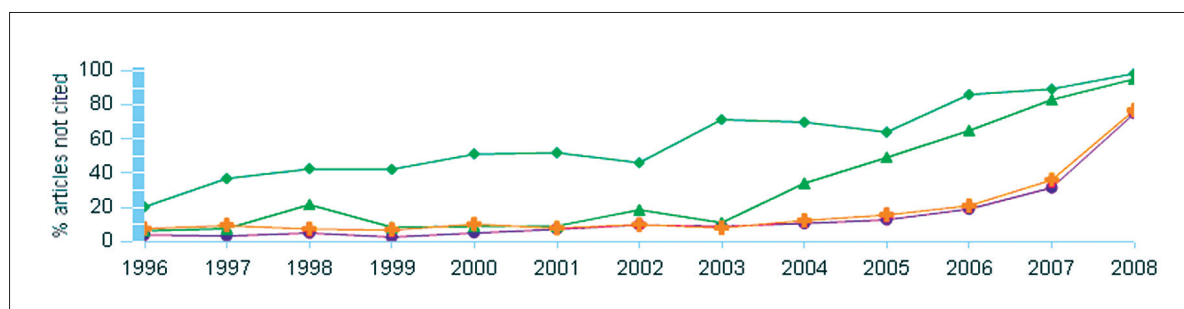


Figure 3 Percent not cited (percentage of articles published in any particular year that have never been cited to date) of the journals. *Interventional Neuroradiology* (♦), *Neurosurgery* (▲), *American Journal of Neuroradiology* (+), *Neuroradiology* (●).

changing area of research as the articles tend to have a shorter shelf-life¹⁰, whereas longer cited and citing half-life figures may reflect the continued importance of articles published in the journal in the past. The half-life figures of *INR* were similar to those of the *American Journal of Neuroradiology* (6.8) and shorter than those of *Neuroradiology* (8.3), *Neurosurgery* (8.9), and the *Journal of Neurosurgery* (> 10.0)⁷.

The Eigenfactor score of a journal is an estimate of the percentage of time that library users spend with that journal; it is calculated based on the citations received over a five-year period¹¹. Like the IF, the Eigenfactor score is essentially a ratio of number of citations to total number of articles. However, unlike the Impact Factor, the Eigenfactor score counts citations to journals in both the sciences and social sciences and eliminates self-citations. According to its Eigenfactor score, *INR* is in the lower 20% of similar journals compared with that of the

American Journal of Neuroradiology and *Neurosurgery* which are in the top 10% of similar journals and *Neuroradiology* in the top 21%¹¹.

The Article Influence Score measures the relative importance of a journal on a per-article basis and consists of the journal's Eigenfactor Score divided by the fraction of articles published by the journal. That fraction is normalized so that the sum total of articles from all journals is 1. The mean Article Influence Score is 1.00. A score greater than 1.00 indicates that each article in the journal has above-average influence. A score less than 1.00 indicates that each article in the journal has below-average influence (Table 4)¹².

How to Improve Interventional Neuroradiology

Citation analysis of research publications has increasingly been adopted as a means of

Table 2 Most commonly cited articles in the Interventional Neuroradiology.

Use the checkboxes to remove individual items from this Citation Report or restrict to items processed between 1983 and 2009 Go		2005	2006	2007	2008	2009	Total	Average Citations per Year
		118	124	137	97	0	942	94.20
1.	Title: Endovascular coil occlusion of intracranial aneurysms assisted by a novel self-expandable nitinol microstent (Neuroform) Author(s): Henkes H, Bose A, Felber S, et al. Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 8 Issue: 2 Pages: 107-119 Published: JUN 2002	7	7	1	2	0	26	3.71
2.	Title: Segmental identity and vulnerability in cerebral arteries Author(s): Lasjaunias PL Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 6 Issue: 2 Pages: 113-124 Published: JUN 2000	4	5	4	0	0	24	2.67
3.	Title: Wyburn-Mason or Bonnet-Dechaume-Blanc as cerebrofacial arteriovenous metamerism syndromes (CAMS) - A new concept and a new classification Author(s): Bhattacharya JJ, Luo CB, Suh DC, et al. Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 7 Issue: 1 Pages: 5-17 Published: MAR 2001	1	2	5	0	0	19	2.38
4.	Title: "Corrosion" of tungsten spirals. A disturbing finding Author(s): Weill A, Ducros V, Cognard C, et al. Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 4 Issue: 4 Pages: 337-340 Published: DEC 1998	0	2	0	0	0	19	1.90
5.	Title: Multiple intracranial arterial aneurysms: A congenital metamerism disease? Review of 113 consecutive patients with 280 AA Author(s): Campos C, Churojana A, Rodesch G, et al. Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 4 Issue: 4 Pages: 293-299 Published: DEC 1998	1	2	3	0	0	17	1.70
6.	Title: 3D rotational angiography: Recent experience in the evaluation of cerebral aneurysms for treatment Author(s): Ishihara S, Ross IB, Plotin M, et al. Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 6 Issue: 2 Pages: 85-94 Published: JUN 2000	1	2	0	0	0	15	1.67
7.	Title: Assessment of complication types and rates related to diagnostic angiography and interventional neuroradiologic procedures - A four year review (1993-1996) Author(s): Horowitz MB, Dutton K, Purdy PD Source: <i>INTERVENTIONAL NEURORADIOLOGY</i> Volume: 4 Issue: 1 Pages: 27-37 Published: MAR 1998	3	1	0	1	0	14	1.40

assessing the apparent quality of journals⁸. Citations theoretically provide a quantifiable measure of a paper's impact on other researchers, and so citation counts, for example, sourced from the Institute of Scientific Information (ISI) have been used to grade and compare journals.

Therefore, to increase citation counts, i.e., IF, *INR* must provide more LinkOut services including PubMed and PubMed Central¹³ which is the U.S. National Institutes of Health free digital archive of biomedical and life sciences journal literature, the Directory of open access journals¹⁴, and other open access projects. In order to improve the article availability of *INR*, one strategic method is for it to be listed in PubMed Central¹⁸. *INR* can meet the criteria required to be listed in Pubmed Central if it qualifies on two levels, i.e. the scientific quality of the publication and the technical quality of its digital files.

The publisher of *INR* should try to adopt digital object identifier (DOI) of the international DOI Foundation, i.e., a permanent digital identifier given to an object which represents the publisher followed by the article number, thereby directly reviewing the article via the URL of [http:// dx.doi.org/doi](http://dx.doi.org/doi) address and also by using a cross-publisher citation linking system that allows a researcher to click on a reference citation on one publisher's platform and link directly to the cited content on another publisher's platform via Crossref¹⁵. Scholarly journals also have different ISSN for each print and electronic version.

In addition to being a public service, open access (OA) allows greater dissemination of articles. In general, medical journals offer subscription-based, selective (partial), delayed, pay-per-

Table 3 Major journals which have cited the *Interventional Neuroradiology*.

Citing Journals	Times Cited	%
<i>Interventional Neuroradiology</i>	133	19.6
<i>Am J Neuroradiol</i>	72	10.6
<i>Neurosurgery</i>	40	5.9
<i>Neuroradiology</i>	36	5.3
<i>Rivista di Neuroradiologia (Neuroradiology Journal)</i>	24	3.5
<i>J Neurosurg</i>	20	2.9
<i>Stroke</i>	17	2.5
<i>Acta Neurochir</i>	16	2.4
<i>Neuroimag Clin N Am</i>	14	2.1
<i>Neurol Surg Tokyo</i>	14	2.1
<i>Surg Neurol</i>	13	1.9
<i>Childs Nerv Syst</i>	11	1.6
<i>J Neuroradiology</i>	10	1.6
<i>Radiology</i>	7	1.0
Others	251	37.0
Total	678	100

view or complete OA¹⁶. An indirect effect of OA, the so-called "citation advantage" is that increased citations lead to a higher impact factor, thereby, increasing a journal's prestige; this effect has been confirmed for sciences other than medicine¹⁷.

Because the emphasis on standards of ethical conduct in the pursuit of high-powered scientific investigation is more prevalent and of more

Table 4 Comparison of Eigenfactor provided by Journal Citation Reports.

Journal Title (Abbreviated)	Impact Factor	5-Year Impact	Immediacy Index	Eigenfactor Score	Article Influence Score
<i>Nature</i>	28.751	30.616	7.385	1.8387	16.996
<i>Science</i>	26.372	30.631	6.387	1.69272	16.539
<i>Neurosurgery</i>	3.007	3.112	0.282	0.0413	0.954
<i>Am J Neuroradiol</i>	2.338	2.705	0.3	0.03855	0.899
<i>Neuroradiology</i>	1.759	1.853	0.242	0.01092	0.638
<i>Interv Neuroradiol</i>	0.169	0.187	0	0.00049	0.054

concern now than ever before, prestigious journals provide peer review, ethical research standards including institutional review board approval, grant information, and financial disclosure in the journal's instructions to authors¹⁹.

Editors are responsible for clearly defining and implementing a journal's ethical standards regarding duplicate publication, ethical standards in research, etc., and are responsible for monitoring possible failures to meet those standards. The authors were more likely to report consent, committee approval or both when journal instructions require that approval be mentioned¹⁹.

Conclusions

Interventional Neuroradiology is an international journal devoted to a highly sub-specialized field with international editorial board members. Articles in *INR* are submitted by authors from many countries worldwide and are peer reviewed by international referees. Considering what the field of interventional neuroradiology is, IF and the Eigenfactor score of *INR* are still low partly because the LinkOut services, including PubMed, are not yet provided in a sufficiently open way. Ethical research standards should be emphasized in *INR*.

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EDITORIAL COMMENT

The manuscript: Current Status and Future Direction of Interventional Neuroradiology, the Official Journal of the World Federation of Interventional and Therapeutic Neuroradiology by authors J.K. KIM, S.H. YANG, P.S. YOUNG, D.C. SUH analyses in some detail the current status of the journal Interventional Neuroradiology. It accurately describes the factors which impact the ranking of professional journals and provides insight as to how current evaluation systems will favour certain profiles of journals.

From the outset our journal was created to represent a forum for exchange of experiences, education and understanding in a newly developed field in medicine, where no such forum existed. It also fulfilled the need to do so on a global basis emphasizing differences in neurovascular disorders across the world and sharing relevant information with the entire neurointerventional community. Over the past few decades other neuroscience journals in the neurosurgical or neuroradiological domains have demonstrated an interest in the field of neuroendovascular therapy and because of their established reputations (impact factors) they became attractive domains for publication of research in our field.

While the number of neurointerventional practitioners around the world will always be small in comparison to other speciality groups in the neuroscience domain, the need to have a dedicated journal serving the global neurointerventional community can hardly be questioned and is exemplified by the positive influence of our journal. The creation of additional local or regional neuroendovascular journals appears to be counterintuitive as further fragmentation is unlikely to lead to a cohesive approach that will enable our new field to find its proper place in the neurosciences. On the other hand, linkage with relevant neuroscience journals such as the AJNR will likely be very helpful to explore the complementary strength that such cooperation will bring and foster the benefits of sharing improved quality of communication to relevant specialists.

The future of Interventional Neuroradiology will certainly be positive if we continue to submit our best work to the journal and if we respect the highest ethical standards while fostering linkage rather than separation from our sister specialties.

KTB

Editor in Chief